

What is claimed is:

- 1        1. A non-circular flat motor comprising:
  - 2            a rotor;
  - 3            a housing formed to be non-circular when viewed in a plane which rotatably
  - 4            supports the rotor and has at least a part of side surfaces being a flat surface; and
  - 5            a plurality of feeder terminals arranged at an angled corner at the side
  - 6            surface of the housing which is formed by electrically insulating all terminals of high
  - 7            electric potential from other portions adjacent thereto.
  
- 1        2. The motor as claimed in claim 1, wherein the armature coil is arranged  
2            at a stator base functioning as part of the housing and a magnet facing the armature  
3            coil is arranged at the rotor.
  
- 1        3. The motor as claimed in claim 2, wherein the housing is substantially  
2            rectangular when viewed in a plane and at least some of the feeder terminals are  
3            formed not to protrude outward over the angled corner as an angled portion for  
4            installation.
  
- 1        4. The motor as claimed in claim 1, further comprising a flat magnet, a  
2            bracket as part of the housing where the magnet is arranged, a brush incorporated  
3            with the feeder terminals via a gap between the bracket and the magnet, wherein  
4            the rotor receives electric power via the brush and faces the flat magnet via a gap in  
5            an axial direction.
  
- 1        5. The motor as claimed in claim 4, wherein a base end portion of the  
2            brush is formed as part of the feeder terminal as it is.
  
- 1        6. The motor as claimed in claim 4, wherein the housing is substantially  
2            rectangular when viewed in a plane and at least some of the feeder terminals are  
3            formed not to protrude outward over the angled corner as an installation portion.
  
- 1        7. A non-circular flat motor comprising:

2 a rotor;

3 a housing including a stator base having a shaft for supporting the rotor  
4 provided at the center thereof and having a non-circular shape when viewed in a  
5 plane, at least some portion of the housing being formed of resin; and

6 at least two feeder terminals arranged at an angled corner at the side surface  
7 of the housing which is formed by electrically insulating all terminals of high electric  
8 potential from other portions adjacent thereto.

1 8. The motor as claimed in claim 7, wherein the shaft is installed by  
2 erecting a shaft core from one portion of the housing constituting a stator and  
3 coating the shaft core with resin to form a resin coated, fixed shaft, and the rotor is  
4 rotatably installed from a tip of the resin coated, fixed shaft and the tip of the shaft is  
5 inserted in a concave portion installed at another portion of the housing.

1 9. The motor as claimed in claim 8, further comprising:  
2 a yoke plate formed of a magnetic body and having the shaft core integrally  
3 protruding from the center thereof, constituting part of the housing;

4 a pair of brushes having a free end in sliding contact with the commutator and  
5 fixed such that at least two surfaces can expose base ends of the resin bracket  
6 portion through the brush recess portion;

7 a resin bracket portion which includes a resin coated, fixed shaft made by  
8 incorporating in the resin bracket portion at least part of the yoke plate and coating  
9 the shaft core with resin;

10 a rotor including a commutator and an armature coil having one end portion  
11 connected to the commutator and rotatably arranged at the resin coated, fixed shaft  
12 to face a magnet via a gap;

13 a brush recess portion formed at the yoke plate to insulate at least one brush;

14 the magnet arranged at least at the yoke portion of the resin bracket portion  
15 after the brushes are arranged; and

16 a case accommodating the rotor and installed at the resin bracket by inserting  
17 a tip of the resin coated, fixed shaft in a concave portion formed at the center of the

18 case, at least a magnetic path portion of the magnet being formed of a magnetic  
19 body.

1 10. The motor as claimed in claim 9, wherein the magnet is separated from  
2 the yoke plate by a small gap to enable reflow soldering.

1 11. The motor as claimed in claim 10, wherein the yoke plate is separated  
2 from the case except for a combined portion.

1 12. The motor as claimed in claim 11, wherein a portion for reflow  
2 soldering is not close to the combined portion.

1 13. The motor as claimed in claim 9, wherein the resin of the resin coated,  
2 fixed shaft includes potassium titanate whisker and has an anti-thermal feature  
3 bearing a thermal deformation temperature of over 200°C (18.5 kgf/cm<sup>2</sup>) and a  
4 slippery feature.

1 14. A non-circular flat brushless motor comprising:  
2 a metal plate incorporating a shaft support portion at the center thereof,  
3 forming part of a housing;  
4 a fixed shaft supported by the shaft support portion;  
5 a rotor rotatably installed at the fixed shaft from a tip thereof; and  
6 a stator formed of a plurality of armature coils arranged around the fixed shaft  
7 to drive the rotor,  
8 wherein the other part of the housing supports a tip of the fixed shaft.

1 15. The motor as claimed in claim 14, wherein the fixed shaft has a shaft  
2 core cut from a metal plate and the shaft core is coated with resin.

1 16. The motor as claimed in claim 14, wherein a pinion is incorporated in  
2 the rotor.